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Proposing a Model of "Hospital Value-Based Purchasing" in Selected Teaching Hospitals in Isfahan, Iran: 2015 - 2016

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Abstract

Background: Recently, HVBP has been a tool for improving the quality of healthcare services and managing costs. This study was conducted to identify and propose an appropriate model of HVBP in the general selected teaching hospitals in Isfahan, Iran.
Objectives: The purpose of this study was to propose an Iranian model of HVBP in the selected teaching hospitals in Isfahan, Iran, 2015 - 16.
Methods: This study was a theoretical and qualitative study. It was cross-sectional and prospective in terms of time, direction, and trend. The sample was determined purposefully in Delphi methods. Three types of Delphi methods were conducted including: theory, policy, and implementation Delphi. The sample size in Delphi methods respectively included 9, 13, and 21 that were selected in type of experts sampling and cascading in 2015 - 16. Inclusion and exclusion criteria were designated to select sample in all three types of Delphi methods.
Results: According to the results of the study, the proposed Iranian model of HVBP had seven dimensions including structure, process, outcome, patient experience, quality of clinical care, sensitivity of care team, and efficiency with the weight percentages of 5, 5, 25, 20, 15, 15, and 15, respectively. Each of the dimensions had 5, 6, 5, 7, 5, 4, and 1 components/component, respectively.
Conclusions: This study identified and proposed a model of HVBP in the Isfahan selected general teaching hospitals. The practical application of the findings was to determine the dimensions and components of HVBP in Isfahan general teaching hospitals. According to the findings of this study, it is suggested that a series of related research be conducted to complete the identification process of HVBP in Iran in other types of hospital settings.

Keywords: Value-Based Purchasing (VBP), Hospital Value-Based Purchasing (HVBP), Model, Pay for Performance (P4P), Insurance, Delphi Methods

1. Background

Healthcare purchasing plays a vital role in the healthcare financing (1, 2). One of the most important purchasing types recently introduced is VBP (3-5). VBP is a payment system that holds providers accountable for both the quality and cost of healthcare that they supply; therefore, it links payments with improved performance by healthcare services providers (6-8). HVBP is a type of VBP in inpatient hospital settings, used as a tool for improving the quality of care and a reasonable cost reduction, and it is considered a type of P4P (6, 9). Health insurance systems, such as Medicare, have developed plans and models for purchasing the required inpatient care and healthcare services with the desired quality and the lowest cost (6, 10). HVBP has been used for the first time by the CMS in the United States (9, 10).

Recent reforms in the healthcare financing systems have led to purchaser and provider split and rethinking in purchasing functions from inactive to active and strategic purchasing (11). In the report of WHO in 2010 it has been expressed that healthcare purchasing should move from inactive to active and strategic approach (12). Since purchasing plays a decisive role in improving quality and costs, health care systems in the world have recently used it as a topic for reforms (12, 13). However, there are several basic approaches for modeling of purchasing and improving the quality of hospital services (14, 15). In Canada, the quality of each hospital will be evaluated and purchased using the hospital health service quality indicators and data collection from the CIHI (16). In the United States, the high quality of hospital care will be purchased using VBP programs and models, along with a positive incentive approach through a bonus payment system (5). In the UK and Germany, the healthcare is purchased by adopting a negative incentive approach, through the payment system, for example, non-payment of hospital fees in re-

hospitalization (6, 17). The HVBP in services and inpatient care has undergone continuous changes over recent years, as the latest editions in 2015 (10) comprised a review of four essential dimensions of hospital services, which included: quality of clinical care, patient experience, outcome, and efficiency (18). Each of these four dimensions has criteria and sub-criteria for measurement, and combination adjust marker is used to measure some of them (9, 10, 18, 19).

In Iran healthcare system, purchasers of inpatient care and hospital services, including basic insurer organizations, purchase hospital care using inactive purchasing strategies (1, 20). Although recently, purchasing has strategic, operational, and organizational goals in the IHIO, the continuing inactive purchasing of services has led to major problems, such as reduced quality of clinical services and performance, weak outcomes of care and consequently, low satisfaction level of patients and hospital care users (20-23).

Recent research has shown that lack of HVBP model or inactive purchasing may cause problems in inpatient care of Iran (1, 20, 23-25), such as inappropriate or incorrect diagnosis, treatment, and rehabilitation of patients in the inpatient care, incomplete treatments, injury to the patient due to error and mistakes in the hospital care, uncertainty and not involvement of the patient in choosing a care method (including diagnosis and treatment methods), low efficiency of the system in providing hospital services, and weak outcome rates for diagnosis and treatment in medical and nursing services (20, 21, 23, 26). In contrast, HVBP model has increased the quality of care and reduced costs by linking payments to acceptable performance (6, 9, 10, 19). Studies conducted in the US health system have indicated a very high effect of the inpatient care purchasing strategy type on the quality of care (6, 10, 27, 28).

One of the main obstacles to quality development and cost management in inpatient care is the lack of modeling of HVBP in Iran. Not only the payment system for inpatient care provided by Iran medical insurance agencies has not improved quality and reduced medical errors in the health care system (20, 21, 23), but also in the reform of Iran's health system, implemented since the second half of 2014, no goal or program has been allocated to VBP or HVBP (29).

In Iran, most studies in the field of inpatient care have only focused on measuring quality indicators of care in accreditation and not on the value-based purchasing (30, 31). It seems that conducting a study for HVBP modeling in Iran hospital settings may be useful to prevent major current problems existed in inpatient care purchasing and it could be creative for value-based purchasing in the hospital care system. Therefore, this study aimed to identify and propose the HVBP model in Isfahan selected general teaching hospitals in 2015 - 16, and attempted to develop a functional and applicable model to improve the quality and reduce the cost of hospital care by linking payment to performance and creation of the value.

2. Methods

Qualitative methods could be more useful for identifying and characterizing comparative studies. This research was a theoretical and qualitative study, and it was cross-sectional and prospective in terms of time, direction, and trend. The sample in this study was purposefully determined in the type of expert sampling in the last month of 2015 and the first month of 2016 in Isfahan teaching hospitals, Iran. The inclusion criteria for the selected sample of all three types of Delphi methods (theory, policy, and implementation Delphi's) included:

- Having related experience in healthcare purchasing studies background (for theory Delphi), and at least three years of related experience in healthcare purchasing background and experience for managers and decision-makers of the IHIO and the general directorate and the staff of the general health Insurance department in Isfahan, and the same experience for the executives of Isfahan university of medical sciences (for Policy Delphi); and three years of implementation experience in hospital, for bosses and managers in selected samples of the hospitals (in implementation Delphi)

- Familiarity with value-based purchasing and related topics

- Being interested and having enough motivation to collaborate in research and Delphi

The exclusion criteria consisted of those individuals who had not sufficient information about the subject or were not willingness to be in Delphi. In the qualitative stage of the study, i.e. the Delphi methods, the number of respondents at the levels of implementation, policy, and theory Delphi were 21, 13, and 9, respectively. As mentioned before, sample selection was purposefully in the type of expert sampling and cascade form. Other features of the respondents and expert target groups are listed in Table 1.

This study was conducted in two independent stages including theoretical study and cascade Delphi methods. As a basis for the current study, Delphi method was used for qualitative research. It is an exploratory method to identify the nature and fundamental elements of a phenomenon (the HVBP model). It is a structured process for collecting data during successive rounds and group consensus. This method was used in three types, including theoretical, implementation, and policy Delphi. Delphi methods were used to identify and evaluate the model from the aspects of theoretical, implementation, and policy.

Table 1. Respondent Characteristics Based on Levels of Delphi Methods

		Sample levels in Delphi Methods		
		Delphi at Implementation Level	**Delphi at Policy Level**	**Delphi at Theory Level**
Selected Sample Features	Number	21	13	9
	Target group (Experts)	Bosses, Managers, Doctors, and Nurses	- Managers of the Ministry of Health and Medical Education in Tehran, and Isfahan University of Medical Sciences (in related fields).	- Isfahan University of Medical Sciences, Iran
			- Insurance directors at the Ministry of Welfare (Tehran Health and Safety Insurance)	- Tehran University of Medical Sciences, Iran
			- Managers of the General Directorate of Health Insurance and Social Security of Isfahan Province	- Iran University of Medical
				Sciences, Iran
				- Maryland University of
				Medical Sciences, United States
				- Harvard and Brandis University, United States
Age, mean		47.2	48.6	51.3
Sex	Male	13	11	7
	Female	8	2	2
Location	Sample composition	7 people from each hospital, and in total, three teaching hospitals in Isfahan (21), Iran	5 people in Isfahan province and 8 people in Tehran, Iran	From each university, one person other than the universities of Isfahan and Iran, each of whom had three faculty members

In the first stage, a theoretical study (literature review) was conducted regarding the issue of hospital value-based purchasing in different countries. The results of the first stage on all types of HVBP conditions in the world were used to develop a structured and summarized draft for the Delphi questionnaire. Therefore, the Delphi preliminary questionnaire was created by using the conceptual framework of the first phase and literature review.

In the second stage of the study, Delphi methods were conducted in 3 rounds and the responders were asked to choose the appropriate dimensions and components for an Iranian model of HVBP, according to the findings of the worldwide studies and the existed conditions and to make comments/suggestions for each question. As mentioned, in the second stage, the Delphi methods were conducted to identify and evaluate the model in accordance with theory, policy, and implementation agreement and group consensus. The way of using the Delphi methods in this study is shown in Figure 1.

In this study, the Delphi preliminary questionnaire was made thorough literature review (the first stage) for using as the data collection tool. Data analysis was conducted using the Delphi method in 3 rounds and in accordance with the process shown in Figure 1, which had four stages. The data analysis revealed dimensions (main constraints), their weight, and related components of the model. Ethical considerations were observed during data collection and analysis using the Delphi rounds.

3. Results

The findings of the three rounds of Delphi methods are presented in the following tables. According to the results of the first stage of this study in theoretical section (literature review), there were three types of known HVBP. The American model of HVBP, in 2015 - 16, had four dimensions (18), the UK (NHS) model had five dimensions (32), and the German model had three dimensions (33). The proposed Iranian model, which is identified by Delphi, had 7 dimensions, as follows:

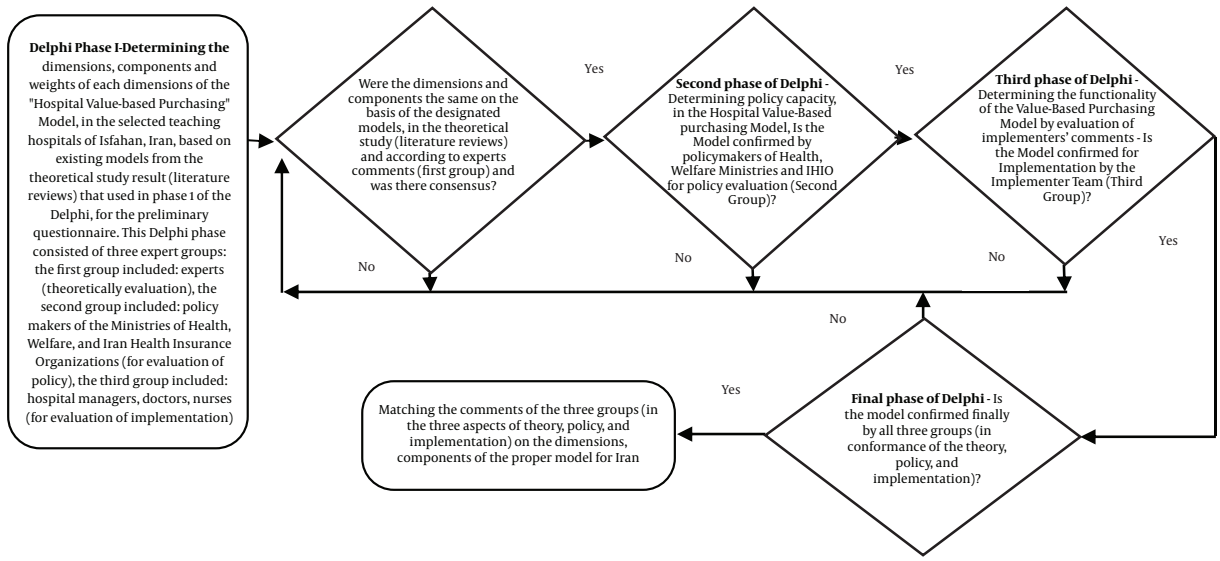

Figure 1. Flowchart of the Delphi Methods

3.1. Dimensions of the HVBP Model

Based on the value of the weight of Delphi findings, presented in Table 2; the dimensions of the Iranian HVBP model included:

Table 2. The Dimensions of the Iranian Hospital Value-Based Purchasing Model

N	Dimensions	Dimensional Weight, %
1	Structural variable	5
2	Process variable	5
3	Outcome variable	25
4	Patient Experience variable	20
5	Quality of Clinical care variable	15
6	Sensitivity of care team variable	15
7	Efficiency variable	15
Total	100	

3.2. The Components of Each Dimension of the Iranian HVBP Model

The Delphi findings are shown in Table 3. The components of the Iranian HVBP model included:

3.3. Considering the Dimensions and Components of the Model

The proposed VBP model (HVBP) for Iran is presented as follows (Figure 2):

4. Discussion and Conclusion

The main goal of the current study was to determine the HVBP model in Isfahan selected general teaching hospitals in 2015 - 16. The study identified 7 dimensions for the HVBP model and 33 components. As the results of the study showed, an important dimension for the identified model was quality of clinical care that included the components or measures such as acute myocardial infarction (AMI), heart failure (HF), pneumonia (PN), surgical care improvement project (SCIP), and Healthcare Associated infections (HAI), similar to the HVBP model in the US (18, 34-37).

As literature review of this study indicated, VBP, which is used as a strategy for improving quality of healthcare services and cost control (38), in health insurance systems is usually in three types (39): Beveridge (British national health system), Bismarck (German insurance system), and more in the Medicare insurance system in the United States. In the following, the results of this study are compared with the mentioned models.

As outlined in the results section, seven dimensions of the HVBP model included structural, process, outcome, patient experience, quality of clinical care, sensitivity of care team, and efficiency in acute care in selected teaching hospitals. The dimensions of this model were similar to those of the US model (18), in terms of quality of care, patient experience, and outcomes, while in the three dimensions of structure, process, and sensitivity of care team our model was different from the US model.

In the United States, with the creation of new payment

Table 3. The Components of the Iranian Hospital Value-Based Purchasing Model

Dimensions	1 Structure	2 Process	3 Outcome	4 Patient Experience	5 Quality of Clinical care	6 Sensitivity of care team	7 Efficiency
Components	- Scientific information and evidence (Standard Clinical Protocols and guidelines)	- Process of performance in clinical ward	- Outcome of acute myocardial infarction	- Patient relationship with nurses	- Acute Myocardial Infarction (AMI)	- Sensitivity of nursing care	Key Efficiency Indicators for Health and Medical Insurance
	- Education	- Process of care communication and information	- Outcome of pneumonia	- Patient relationship with doctors	- Heart Failure (HF)	- Nursing workplace Satisfaction questionnaire	
	- Experience	- Process of patient safety	- Outcome of heart failure	- Responsibility of hospital staff	- Pneumonia (PN)	- Satisfaction of the patient with nursing and medical care	
	- Exclusive scientific evidence and creative technology	- Process of the care team safety	- Outcome of central Line Infection	- Pain management comfort of the hospital environment	- Surgical Care Improvement Project (SCIP)	- Key sensitivity analysis compared to the regional national benchmark	
	- Technology and equipment	- Process of the care documentation	- Outcome of patient safety	- Pharmaceutical relationship	- Healthcare Associated infections (HAI)		
		- Process of care planning and management		- Clearance information			

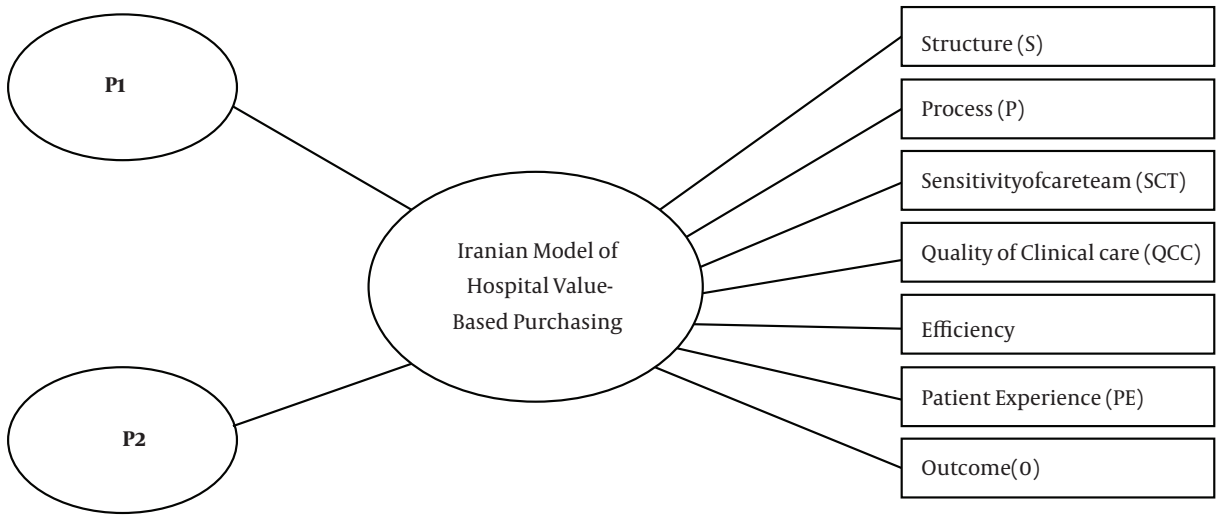

Figure 2. The Proposed Model for Iran Hospital Value-Based Purchasing (IHVBP) - Based on Delphi Findings

models and alternatives, the payment system has been changed from retrospective, volumetric, quantitative or pay for services (FFS) to prospective, qualitative and value-based payments (18, 35, 40-46). The HVBP is computed using the following four dimensions (9, 18, 34, 37, 47, 48):

- Quality of the clinical care (Q),
- Patient Experience (PE)
- Outcome (O)

- Efficiency (E)

In the US model of HVBP, the weights of the HVBP dimensions are expressed in terms of TPS (4, 18, 37, 48). TPS in VBP is calculated based on four dimensions including quality of clinical care 20%, patient experience 30%, outcome 30%, and efficiency 20% of TPS in 2016 - 2017 (18, 37, 48-50):

(E) 20% + (O) 30% + (PE) 30% + (Q) 20% = TPS

The identified model in this study had different weights compared to the US model, but concerning the weights of dimensions in the both, the highest weight in both models was on outcome.

In a survey, a VBP model in the UK national medical system had largely 5 dimensions, which was included in the 5-year medium-term contracts (51). The identified model in this study was 7-dimensional and had two common dimensions, namely patient outcomes and quality of clinical care, with the model of NHS while it had 5 different nominal dimensions, but relatively similar in reality (52).

In the NHS of the United Kingdom, value-based purchasing is included in the conclusion of contracts for purchasing hospital care in five years. For example, in NHS BCCG and in musculoskeletal care, for a five-year contract concluded in this regard, the payment system had two parts: a fixed part (Bundled payment), in which the total amount is reduced from 97.7% to 80% for the whole five years of the contract in a descending trend, and a variable part (outcomes-based payment), which changes from 2.5% to 20% in a total of five years of the contract during these five years in an ascending trend (51, 52). The dimensions used in calculating the financial incentive of VBP included (52):

- Innovative use of technology (T)
- Continuous and exclusive care (I)
- Improved patient outcomes (O)
- Patient experience quality (E)
- Published annual report (AR)

The amount of financial incentive is calculated in each season, using the following formula (51):

Financial incentive = 20% (T) + 20% (I) + 30% (O) + 20% (E) + 10% (AR)

The results of this study had similarities with the German model of VBP, in three structural, process, and outcome dimensions, and had a nominal difference in other four dimensions. However, the HVBP is very new in both countries, and the both models focus on outcomes (The highest weight in both models was on outcome.)

In the German health system, the following dimensions have been considered in traditional VBP (33, 38, 53):

- Cost and efficiency of healthcare providing (C)
- Hospital efficacy status, with considering the integration status (E)
- Effective and value-added clinical path, approved by the sub committee of values (CP)
- Effective medicine and technology (T)
- Quality management system (QMS)
- Structural measures (S)
- Process and care measures (P)
- Quality outcome measures (O)

In this review, there was no specific formula for VBP, although the German system followed the European quality management system (33). The German model of HVBP is based on the quality management model and it is based on the three structural, processes, and outcome dimensions that these dimensions are common with the resulting model in this study.

Germany has one of the oldest national health systems. In the last 15 years, a new health system infrastructure has been evaluated for value-based, which included medicines, treatments, and health care pathways, and focused on the outcomes and accepted them as indicators (33, 38).

In Germany, health technology assessment methods, a lot of emphasis on cost savings, and the pharmaceutical industry were issues that related to VBP (54). In general, recent reforms in the German health system in relation to VBP included (33) the 2000 reform and diagnostic reimbursement groups DRG system and quality management system introduced in the same year. In the 2005 reform, laws were passed, which considered the quality of providing care and services in terms of structural measures, such as diagnostic devices, workforce numbers and skills, and care processes. In 2007, hospitals were required to present a limited report on the final quality implications.

In this study, the dimensions of the identified model have similarities and differences with others in different health (insurance) systems, but in all models of HVBP, the emphasis was on the outcome and it was the most important dimension that had the highest weight.

This study identified and proposed a model of HVBP in the Isfahan selected general teaching hospitals. The practical application of the findings was to determine the dimensions and components of HVBP in Isfahan general teaching hospitals. According to the findings of this study, it is suggested that a series of related research be conducted to complete the identification process of HVBP in Iran and then to begin the solving process of healthcare purchasing problems in Iran. In this regard, studies are recommended to identify dimensions and components of HVBP in other hospital settings in Iran.

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Footnote

Implication for Health Policy Makers/Practice/Research/Medical Education: This study proposes an Iranian model of hospital value-based purchasing (HVBP).

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